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S/147/59/000/04/013/020
E022/E435

The Characteristic Radius and its Role in the Choice of the Parameters for Supersonic Gas Turbines

Upper indices:

* - index of stagnation properties
' - index of parameters behind the normal shock, index of parameters in the changed velocity diagram.

In order to be able to decide whether to employ a single stage or a multistage turbine and to decide the minimum number of the stages required, it is necessary to know by how much one can increase the power output from one stage of the turbine. From Euler's equation (Eq (1)) it is seen that the output of an axial turbine may be increased either by increasing the peripheral velocity u or by increasing the sum of the peripheral components $\Delta c_u = c_{1u} + c_{2u}$. The increase of power by the latter method corresponds to increasing the loading of the stage. There are two possible ways of doing this. The first is to increase only c_{1u} with c_{2u} being kept substantially unchanged, usually almost equal zero, ie with the axial

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efflux of the gas. This may be achieved by decreasing the degree of reaction of the stage, as can be seen from Eq (2). The second way is to increase c_{2u} with c_{1u} being kept substantially unchanged. The former alternative leads to the appearance of the negative reaction and to the supersonic speeds on the rotor blades near the roots of the blades. The latter produces non-axial efflux of the gas at the exit from the stage. The object of this paper is to investigate the possibility of increasing the loading of the blades by means of the first alternative, especially when the flow becomes supersonic before it reaches the blades of the rotor. Such a turbine will be denoted in the further discussions by the abbreviation СЗГТ (ie Super-Sonic Gas Turbine - SSGT). With an arbitrary selection of the parameters of the gas flow at the mean radius of the stage (such as peripheral speed, flow angle α_1, degree of reaction etc) there will exist different radial gradients of variation of the degree of

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reaction ρ_T and of the velocity coefficient of the relative motion λ_{1w}. As a result of this it may happen that at some section of the blade, the gas will be diffused and flow with subsonic speeds ($\rho_T < 0$, $\lambda_{1w} < 1$) as shown in Fig 1a. This state of affairs leads to higher power losses. As the degree of reaction diminishes, with other design parameters (α_1 and u) remaining unchanged, the region of subsonic diffusing flow grows smaller and is displaced upwards along the blade. At some particular degree of reaction (which is called the maximum admissible degree of reaction) the flow in the blade passages becomes active at some particular radius while the entry velocity becomes sonic. In further discussion the choice of the parameters of SSGT will be limited by the condition that with the maximum admissible degree of reaction at the mean radius, no subsonic diffusing flow may develop anywhere in the rotor. With this assumption, the notion of the relative characteristic

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radius $\bar{r}_x$ as defined by Eq (3) is introduced. Its magnitude may be either less or more than unity. Utilizing now the relationship between the stagnation temperature of the absolute motion and that of the relative motion as well as the geometrical relations of the velocity diagrams, the relation of Eq (4) may be developed (see Ref 2). Assuming further that the flow at the exit is axial ($c_{2u} = 0$) and that $\lambda_{1w} = 1$ and $\rho_T = 0$, then λ_1 may be eliminated between Eq (2) and (4) so that Eq (5) is obtained. This equation represents thus the necessary condition for the existence of the characteristic radius. Next it is assumed that the temperature along the blades remains constant and then the flow parameters at the characteristic radius are related to the corresponding values at the mean radius. This is done for three different modes of blade shape, viz $c_u.\bar{r}$ = const, α_1 = const and $\bar{r}.\tan\alpha_1$ = const. For each of these blade shapes the relation $\bar{r}_x$ versus $\lambda_{u_{cp}}$ is plotted

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in Fig 2, for various values of α_{1cp}. These graphs show that $\bar{r}_x$ diminishes with increasing α_{1cp} and λ_{ucp}. This may be explained by referring to Fig 3 which represents the velocity diagram for the conditions at the characteristic radius of the active stage with an axial outflow of the gas. Neglecting small variations of the ratio T^*_w/T^*_o, which obtains when the velocity diagram is changed, then instead of the condition $\lambda_{1w} = 1 = \text{const}$, it may be assumed that $w_1 = w'_1$, which requires, as is clearly seen from the diagram, that $u\_$ must decrease as α_1 increases. This dependence of $\bar{r}_x$ on α_{1cp} and λ_{ucp} influences all other characteristics of the stage. For a given value of $\bar{r}_x$ or for some chosen values of α_{1cp} and λ_{ucp}, the parameters at the mean diameter of the stage of a SSGT (such as the degree of reaction $\rho_{TO_{cp}}$ and the absolute velocity coefficient λ_{1cp}) will depend upon the manner in which the blades are shaped.

Card 6/13 Therefore, in order to decide on the choice of the

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manner of blade shaping in a SSGT, it is necessary to compare the power output, the rates of flow, the reserves of power, the degrees of reaction at the meridian sections as well as the angles of rotation of the flow at the exit of the stage for similar rotors with different shapes of the blades. If the difference between the kinematic degree of reaction ρ_T and the corresponding degree of reaction with the adiabatic process ρ_{TO} is neglected, then it is not difficult to determine the maximum admissible degree of reaction $\rho_{TO_{cp}}$ and the coefficient λ_{1cp}. Thus as shown in Ref 3, for α_1 = const, they are as quoted in the middle of page 112. Investigations with the elementary stages of SSGT show that, depending upon the intensity of shock losses, the flow in the blade passages of the rotor may either speed up or slow down. It is necessary, therefore, to be able to determine which type of the flow takes place in the full stage of

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a SSGT when the characteristic radius does exist. If with $\rho_{TO} < 0$ for any $\bar{r} < \bar{r}_x$ the flow in the rotor is supersonic, then $\lambda_{1w} > 1$. Experience shows that slowing down of the supersonic stream ahead of the cascade of the rotor may be approximated by the corresponding reduction of speed through a shock. In that case

$$\lambda'_{1w} = \frac{1}{\lambda_{1w}}$$

Any subsequent speeding up of the flow means that $\lambda_{2w} > \lambda'_{1w}$, and the magnitude of λ_{2w} will depend upon the losses across the shock. As $\bar{r}$ increases and approaches $\bar{r}_x$ the difference between λ_{2w} and λ'_{1w} diminishes since $\lambda'_{1w} \rightarrow \lambda_{1w}$. Assuming now that the total pressure losses of the flow through the rotor are negligible, then in the limiting case Eq (6) is true. To analyse in general terms what flow takes place in those parts of the rotor passages which lie at radii

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smaller than the characteristic radius is a very difficult problem. For this reason a particular case is discussed and the conclusions are generalized. The case considered is that with $\alpha_1 = 30^\circ$ = const along the radius and $\lambda_{ucp} = 0.6$. In this case the characteristic radius coincides with the mean radius and there is no rotation of the flow leaving the rotor. Slight change in α_2 in the radial direction makes it possible to assume that the pressure past the rotor is constant. Taking now some particular values of $\bar{r} < \bar{r}_x$ the magnitudes of λ_1, p_1/p_o^*, λ_{1w} and λ'_{1w} are determined for each of these radii. Next $(p_{1w}^*/p_o^*)_{ad}$ is determined and, since the coefficient of pressure rise across the normal shock is known, p_{1w}^*/p_o^* can be found. The velocity coefficient λ'_{1w} behind the shock being known, the magnitude of the static pressure behind the shock can also be found. The results of these computations are plotted in the form of graphs as shown in Fig 4. It is seen that the

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curve $\frac{p_1'}{p_o^*} = \frac{p_{1w}'}{p_o^*}$ intersects the line $\frac{p_2}{p_o^*}$ and the shadowed area between them is divided in two regions. In the upper region the flow speeds up and in the lower region the flow is either diffused or may be reversed. In practice the root sections of the blades will be in the upper region with the flow speeding up past them since the diffusing and reversed flow region corresponds to very small radii. Next the specific work of the stage is considered. Since at the characteristic radius the elementary stage is an active stage with the axial flow at the exit, hence $H_{TU} = 2$ and Eq (7) is valid. Assuming equal specific work for all elementary stages then Eq (8) may be used. In general, the magnitude of the specific work will depend upon the type of blade shape and on λ_{ucp}, but for the case α_1 = const it does not depend upon λ_{ucp}. Fig 5 shows the effect of the blade shaping upon the specific work

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for the cases $\bar{r}.c_u$ = const, α_1 = const and $\bar{r}.\tan\alpha_1$ = const. The wide range of choice of α_{1cp} and the peripheral velocity coefficient λ_{ucp} leads to very substantial variations of the position of the characteristic radius. As a result of this, the other parameters of the stage will also vary substantially. Not all of these may be chosen at will when designing a turbine. It is advisable to narrow down the possible range of choice of the characteristic radius. The best approach to the problem is via λ_{1w}. It is known that for $\lambda_{1w} \leqslant 1.4$ the losses in the cascade of the rotor are small, while for larger λ_{1w} they increase rapidly. It is appropriate, therefore, to take this value of λ_{1w} as the limit and to relate to it the maximum length of the blades. Since for $\chi_{min} \geqslant 4$ $\bar{r}_{min} \geqslant 0.75$ it is seen that as $\bar{r}_{min} \to 1$ the length of the blades becomes smaller and smaller and SSGT degenerates into an elementary stage. Turbines should be capable of

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delivering some surplus of work of amount δ. The increase of the stage output when it is chocked may be achieved by expanding the gas in the oblique section of the rotor cascade while reducing the back pressure. If, however, for an arbitrary value of the specific work there is $\lambda_{2w} > \lambda_{2w\ \text{пред}}$, this cannot be done ($\delta < 0$). The limitation of the range may also be obtained via the meridian opening and the exit angle of the stream from the stage. The angle of opening is assumed to be one-sided only and of magnitude of $\gamma = 25°$ while the rotation of the stream is taken to be less than $\pm 10°$ so that $80° \leqslant \alpha_2 \leqslant 100°$. All these limitations are shown in Fig 6 to 8. Thus the range of values of r_x and λ_{ucp} between the limiting lines in the figures may be considered as admissible for SSGT. If the actual conditions of flow are taken into account, it is necessary to diminish slightly the degree of reaction which will result in a small displacement of the characteristic radius. Finally the author computes an

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example for the following data: $\alpha_{1cp} = 25°$, $\lambda_{ucp} = 0.65$ (which results in $\bar{r}_x \approx 1$ and nearly cylindrical stage), $T_o^{н} = 300°$ abs, specific work 0.846. The results are shown in Fig 9. There are 9 figures and 3 Soviet references.

ASSOCIATION: Kafedra AD-1 Moskovskiy aviatsionnyy institut (Chair AD-1, Moscow Aviation Institute)

SUBMITTED: July 3, 1959

Card 13/13

30242

S/145/60/000/002/010/020
D221/D3C8

26.2122

AUTHORS: Bykov, N. N., Yemin, O. N., and Cherkasov, B. A., Candidates of Technical Sciences

TITLE: Selecting parameters for a partial gas turbine, and the effect of the degree of partiality on its characteristic

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Mashinostroyeniye, no. 2, 1960, 98 - 110

TEXT: The drop in turbine efficiency due to shorter blades which are used for design considerations, can be improved by introducing a partial disposition of the diffusor on the periphery. This has, however, a detrimental effect as well. The authors carried out research on this matter using a model gas turbine, whose specifications are described. Partiality was modified by covering some diffusor channels, when not only the ratio was changed, but also the disposition of distributor channels. Fig. 3 indicates the variation of efficiency with ratio of partiality, when all ports were

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together (number of pairs of diffusors, i = 1). The coefficient of efficiency is expressed as a ratio of internal work of the turbine to the adiabatic work of expansion. The similarity of conditions of gas turbine operation is given by two dimensionless parameters, $\frac{u}{C_{ag}}$ and $\frac{u}{\sqrt{T_0^*}}$, and the results obtained were replotted in relation to relative efficiency as a function of degree of partiality ε. The curves reveal that the latter has a different effect on efficiency for various u/C_{ad}, and its optimum depends on the degree of partiality (dotted line). Data of different investigators were used for evaluating the blade height effect on turbine efficiency. The available results on the effect of height in a flat stationary diffusor needs systematizing. When selecting the optimum ratio of partiality and height of blades, the authors assumed that losses due to both are independent of each other, and therefore, the total effect of these can be assessed by the total coefficient of relative efficiency given in

$$\bar{\bar{\eta}}_{T(\varepsilon,\ h)} = \bar{\eta}_T \, \bar{\eta}_{Th} = f(\varepsilon,\ h) \tag{7}$$

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Selecting parameters for a partial ...

Full line curves of Fig. 6 indicate the relationship between the relative coefficient of efficiency and height of blades for various values of ε. Dotted lines show efficiency versus blade height, and correspondingly the ratio of partiality, with other parameters being constant. Analysis reveals that it is expedient in several cases to reduce the height of blades, rather than use low ratio of partiality. Similar graphs were plotted for other possible cases of effect due to blade height. Experiments demonstrated that the reaction of the partial turbine remains practically constant for a wide range of conditions. This simplifies the calculation of characteristics of these turbines. Decrease of reaction optimum is due to effects of losses in friction and ventilation which form a significant part of total losses. The above can be reduced with lower peripheral speed u. Passage to a two-segment inlet arrangement leads to fall in efficiency, compared to a single segment disposition. Axial clearance effect on this turbine was also investigated, and its increase caused a drop in efficiency. Stresses at the root of the blade in 8 open channels together are greater than in the case of 31 ports. Uniform distribution of ports is favora-

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ble for stresses at the root of the blades. Increased axial clearance in a partial turbine reduces the above stresses. The analysis reveals that it is expedient to probe into the problem of optimum ratio of partiality in respect to the height of blades. This optimum depends in the first instance on losses related to partiality and the height of blades. The author admit that the results of their investigation are not universal and need a further increase in accuracy which can be achieved by detailed research. There are 12 figures, 1 table and 6 Soviet-bloc references.

ASSOCIATION: Moskovskiy aviatsionyy institut (Moscow Aviation Institute)

SUBMITTED: December 15, 1959

L 25569-66 EWT(m)/EWP(f)/T-2

ACC NR: AM6008536 MONOGRAPH UR/

51
B+1

Cherkasov, Boris Aleksandrovich

23

Automation and control of air-breathing jet engines (Avtomatika i regulirovaniye vozdushno-reaktivnykh dvigateley) Moscow, Izd-vo "Mashinostroyeniye," 1965. 402 p. illus., biblio. Errata slip inserted. 5500 copies printed.

TOPIC TAGS: jet engine, jet engine design, ram jet engine, nuclear powered aircraft, engine control system, automatic control, aircraft control equipment

PURPOSE AND COVERAGE: This is a textbook for the course "Automation and Control of Air-Breathing Jet Engines," which is given in aviation schools of higher education. It may also be useful to engineers and technicians working in the field of automatic aircraft engine controls. The book presents the basic principles of control of gas turbine and ram-jet engines. Emphasis is placed on the peculiarities of the working processes of various types of air-breathing jet engines and their components, which exert a substantial influence on the operation of all their control systems. Analytic and experimental methods of studying control systems and calculating control units are examined. The general concepts of nuclear air-breathing jet engine control, of the principles of optimalizing control of aircraft power

Card 1/3 UDC: 629.13:621.454.001.1

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plants, and of statistical calculation methods permitting the influence of random effects on control systems to be taken into account are also covered.

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SUB CODE: 21/ SUBM DATE: 01Sep65/ ORIG REF: 023/ OTH REF: 003

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SOV/122-58-11-15/18

AUTHORS: Bur'yanov, V.F., Candidate of Technical Sciences
Cherkasov, B.G., Engineer

TITLE: Continuous Light Profile Rolling Mill 350 (Nepreryvnyy melkosortnyy stan 350)

PERIODICAL: Vestnik Mashinostroyeniya, 1958, Nr 11, pp 79-84 (USSR)

ABSTRACT: The rolling mill shown in plan in Fig.1 and described in detail is intended for round bar of 10-30 mm diameter, square bar 10-30 mm across, flat sections of 10-25 mm width and 4-13 mm thickness, equal angles Nos.2-5 and strip between 50 x 1.5 and 200 x 6 mm, all of carbon steel. Slabs of 80 x 80 and 106 x 106 mm and about 9 m length are used. Of the 15 rolling stands, two in the roughing group and three in the finishing group have vertical rolls, the remaining 10 have horizontal rolls. The roughing group contains 7 and the finishing group 8 stands. The table lists the main data of all stands. A horizontal working stand is shown in Fig.2 and a vertical working stand in Fig.3 (cross-section).

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Continuous Light Profile Rolling Mill 350

Single-drum and double-drum fly shears are installed between the finishing rolling stand group and the cooling unit. The single-drum shear mechanism shown in Fig.4, consists of knives at the end of rockers pivoted on the periphery of the rotating drum. The rockers are separated by a spring but are brought together under the action of electro-magnetically actuated cams. Theknives meet and cut the profile. The transporting, cooling, straightening and storage facilities are briefly described. Fig.5 shows the round bar calibrating schemes for diameters between 14 and 30 mm. Several faults revealed in service are enumerated. The single drum shears required strengthening of several components. The roller bed to the cooler had to be abondoned owing to design faults. The dropping of stock caused warping and the mill could thereafter be used only for round bar and similar products. Reliable sealing of the de-scaling water could not be achieved in the working stand with

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Continuous Light Profile Rolling Mill 350

vertical rolls. Flames from the heating furnace had to be held back by compressed air. The mean output of the mill in 1957 was 53 tons per hour. There are 5 illustrations and 1 table.

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CHERKASOV, B.P.

[Week-and-day planning and dispatching in construction; experience of the trust of the Ministry of Construction of the Enterprises of Heavy Industry] Nedel'no-sutochnoe planirovanie i dispetcherizatsiia v stroitel'stve; opyt tresta Ministerstva stroitel'stva predpriiatii tiazheloi industrii. Moskva, Gos. izd-vo lit-ry po stroitel'stvu i arkhitekture, 1952. 103 p.
(MLRA 6:5)
(Construction industry--Management)

GROMEKA, V.P.; REZNIKOV, N.Ya., inzh.; CHERKASOV, B.P.; POLOZOV, M.A.; VERKHUNOV, N.G.; EKK, V.Ya., inzh.; BILLER, S.R., inzh.

Foresters discuss protective tree planting. Put' i put.khoz. 7 no.4: 38-39 '63. (MIRA 16:3)

1. Starshiy inzh. Zaporozhskoy distantsii zashchitnykh lesonasazhdeniy, Pridneprovskoy dorogi (for Gromeka). 2. St. Zaporozh'ye, Pridneprovskoy dorogi (for Reznikov). 3. Nachal'nik proyektno-izyskatel'skogo otryada po zashchitnym lesonasazhdeniyam, Rostov-na-Donu (for Cherkasov). 4. Starshiy inzh. proyektno-izyskatel'skogo otryada po zashchitnym lesonasazhdeniyam, Rostov-na-Donu (for Polozov). 5. Nachal'nik distantsii zashchitnykh lesonasazhdeniy, Karaganda, Kazakhskoy dorogi (for Verkhunov). 6. Stantsiya Karaganda, Kazakhskoy dorogi (for Ekk, Biller).

(Windbreaks, shelterbelts, etc.)

CHERKASOV, D. P., Candidate Vet Sci (diss) -- "The antitoxic function of the liver in highly productive cows under normal conditions and with metabolic disorders". Moscow, 1959. 18 pp (Moscow Vet Acad of the Min Agric), 140 copies (KL, No 24, 1959, 147)

L 3895-66 EWT(m)
AM5025574 BOOK EXPLOITATION UR/ 50
577.391 (075.8) B+1

Volkov, Georgiy Dmitriyevich; Lipin, Vasiliy Aleksandrovich; Cherkasov, Dmitriy Pavlovich

19

Radiobiology (Radiobiologiya), Moscow, Izd-vo "Kolos", 1964. 231 p. illus., 7,000 copies printed. Series note: Uchebniki i uchebnyye posobiya dlya vysshikh sel'skokhozyaystvennykh uchebnykh zavedeniy.

TOPIC TAGS: radiobiology, radiology, nuclear radiation, ionizing radiation, radiation biologic effect, radiation plant effect, horticulture, animal husbandry, radiation sickness, radioactive contamination, nuclear protective equipment, nuclear safety, nuclear shielding

PURPOSE AND COVERAGE: This textbook of radiobiology presents the principles of general radiology, elements of the physics of nuclear radiation, dosimetry, and radiometry of ionizing radiation. It gives an introduction to the use of ionizing radiation in cattle breeding and agriculture as well as sanitary radiometric control of objects in veterinary supervision. Also, the textbook gives an account of basic radiation safety and the organization of work with radioactive materials. This book is intended for veterinary institutes and departments.

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SUB CODE: LS, NP

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NO REF SOV: 000

OTHER: 000

Card 2/2

CHERKASOV, G.

What hinders the introduction of efficient standard plans. Zhil.stroi. no.10:12-14 '59. (MIRA 13:2)
(Sverdlovsk Province--Architecture--Designs and plans)

L 38383-66 EWT(1) GW

ACC NR: AT6011147 SOURCE CODE: UR/3197/65/000/002/0209/0216

AUTHOR: Tsygankov, A. V.; Aleshin, V. M.; Cherkasov, G. I.

22

B+1

ORG: none

TITLE: Multidiscipline study of the most recent and contemporary movements of the earth's crust in the Lower Volga region

SOURCE: AN EstSSR. Institut fiziki i astronomii. Sovremennyye dvizheniya zemnoy kory. Recent crustal movements, no. 2, 1965, 209-216

TOPIC TAGS: structural geology, tectonic movements, geodetic ~~leveling~~ survey

ABSTRACT: The most recent and contemporary tectonic movements of the earth's crust play a leading role in the formation of relief and structure and also in the control of geomorphological processes taking place on the earth's surface. These movements result from the displacement along faults of blocks of the crystalline basement. A direct relationship between qualitative and quantitative criteria is established which can be used to corroborate the correctness of certain conclusions. Regional study of these crustal movements makes it possible to detect large geotectonic elements caused by movements of blocks in the basement. Zones of local uplift and subsidence can be identified against the regional background of uplifts and subsidences, using multidiscipline structural-geomorphological methods and repeated leveling. Inadequate assessment of the role of the most recent and contemporary

 UDC: 550.342

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movements of the earth's crust often leads to incorrect interpretation of the time of formation of structural forms. In addition, tectonic activity tends to improve reservoir capabilities and sometimes even helps to create the reservoirs (by jointing). [JJ]

SUB CODE: 08,[redacted]/ SUBM DATE: none/

Card 2/2 mLP

CHERKASOV, G.I., dotsent; TSUPIKOV, S.G., inzh.

Possibilities for using Sakhalin oxidized petroleum in road construction. Sbor. trud. Khab. avt.-dor. inst. no.2:83-88 '62. (MIRA 18:4)

1. Khabarovskiy avtomobil'no-dorozhnyy institut.

CHERKASOV, G.I., dotsent

Graphic method for the selection of two-component compact mixes. Sbor. trud. Khab. avt.-dor. inst. no.2:100-102 '62. (MIRA 18:4)

1. Khabarovskiy avtomobil'no-dorozhnyy institut.

CHERKASOV, G. M.

"The Mechanics of Steel Destruction by Corrosion Fatigue," Trudy Taganrogskogo Instituta Mekhanizatsii Sel'skogo Khozyaystva, No. 1, Rostov, 1937.

KRICHEVSKIY, M.Ye., arkhitektor; CHERKASOV, G.N., arkhitektor;
VANNIKOVA, Ye.M., arkhitektor

Color in the interior of industrial premises. Prom. stroi. 43 no.10:41-44 '65. (MIRA 18:11)

1. TSentral'nyy nauchno-issledovatel'skiy i proyektno-eksperimental'nyy institut promyshlennykh zdaniy i sooruzheniy (for Krichevskiy, Cherkasov). 2. TSentral'nyy institut nauchnoy informatsii po stroitel'stvu i arkhitekture (for Vannikova).

CHERKASOV, Geliy Nikolayevich, kand. ekon. nauk; KOGAN, Ye.L., red.

[In the interest of millions] V interesakh millionov. Moskva, Izd-vo "Znanie," 1964. 37 p. (Novoe v zhizni, nauke, tekhnike. III Seriia: Ekonomika, no.11) (MIRA 17:7)

CHERKASOV, Geliy Nikolayevich, kand.ekonom.nauk; KOMAROVA, T.F., red.; SAVCHENKO, Ye.V., tekhn.red.

[The working day under the socialism] Rabochee vremia pri sotsializme. Moskva, Izd-vo "Znanie," 1960. 37 p. (Vsesoiuznoe obshchestvo po rasprostraneniiu politicheskikh i nauchnykh znanii. Ser.3, Ekonomika, no.22). (MIRA 13:8)
(Hours of labor)

PRUDENSKIY, G.A., red.; SOMINSKIY, V.S., otv. red.; BELOUSOVA, V.S., red.; DEVYATOV, G.S., red.; ISAYEV, Ye.N., red.; MEKKEL', S.A., red.; CHERKASOV, G.N., red.; KUPAYEVA, L.A., red.; MAZUROVA, A.F., tekhn. red.; VYALYKH, A.M., tekhn. red.

[Potentials of working time in the industries of Siberia] Rezervy rabochego vremeni v promyshlennosti Sibiri. Pod obshchei red. G.A.Prudenskogo. Novosibirsk, Izd-vo Sibirskogo otd-niia AN SSSR, 1961. 221 p. (MIRA 15:8)

1. Akademiya nauk SSSR. Sibirskoye otdeleniye. Institut ekonomiki i organizatsii promyshlennogo proizvodstva.
(Siberia--Labor productivity)
(Siberia--Time study)

CHERKASOV, Geliy Nikolayevich; FOMENKO, I.P., red.

[For the trade-union activist group on the scientific organization of work] Profsoiuznomu aktivu o nauchnoi organizatsii truda. Moskva, VTsSPS Profizdat, 1965. 94 p. (Bibliotechka profsoiuznogo aktivista, no.2(98))
(MIRA 18:4)

CHERKASOV, I.

Sovkhozy i ikh rol'v sotsialisticheskom sel'skom khoziaistv [State farms and their role in socialist agriculture]. Moskva, "Mosk, rabochii," 1952. 84 p.

SO: Monthly List of Russian Accessions, Vol. 7 No. 2 May 1954.

CHERKASOV, I.

Two books on wages in forestry. Sots. trud no.5:151-156 My '57.
(Forestry) (Wages) (MLRA 10:6)

CHERKASOV, I.

Methodological conference on determining the level of labor productivity in forest working circles. Biul. nauch. inform.: trud i zar. plata 4 no.9:62-63 '61. (MIRA 15:1)
(Forests and forestry--Labor productivity)

CHERKASOV, I.

"Working conditions and wage systems in the forest economy" by E.N. Nemirovskii, G.I.Rebrova, S.M.Savinkov. Reviewed by I.Cherkasov. Sots. trud 6 no.4:154-157 Ap '61. (MIRA 16:7)
(Forest workers) (Nemirovskii, E.N.) (Rebrova, G.I.) (Savinkov, S.M.)

BUZYKIN, V.; TURBIN, B.; CHERKASOV, I.

For a wider introduction of the piecework bonus wage system on state farms. Sots.trud 7 no.3:59-65 Mr '62. (MIRA 15:3)
(Agricultrual wages) (Piecework)

CHERKASOV, I.A.

26-58-4-20/45

AUTHORS: Sharikov, Yu.D., and Cherkasov, I.A.

TITLE: Aerial Photography for Investigating Sea Waves (Aerofoto s"yemka v izuchenii morskikh volneniy)

PERIODICAL: Priroda, 1958, Nr 4, pp 83-85 (USSR)

ABSTRACT: Aerial photos of the sea enable the determining of the geometrical elements of the individual wave and of the swells. Experiments for the development of a dependable method were conducted by the Laboratory of Aeromethods of the AS USSR in 1956. This method determines all the details of a wave: its shape, height and static distribution of surfaces with the various angles of inclination. The photographs are taken from two separate aircraft. Both aerial cameras are controlled from one plane by means of a radio device which regulates the correct exposure. The distance between the two planes is controlled by an optical aiming device. To ensure uninterrupted photographing, both cameras are installed in the fuselages where they can be immediately reloaded. The processing of the pictures is performed in the same way as for cartographic purposes. The camera used was an AFA-37 with a focal distance of 70 mm. Figure 1 shows a picture

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of a swell, Figure 2 the contours, and Figure 3 the profiles of the photographed waves.
There is 1 photo and 2 charts.

ASSOCIATION: Laboratoriya aerometodov Akademii nauk SSSR - Leningrad (Laboratory of Aeromethods of the USSR Academy of Sciences - Leningrad)

AVAILABLE: Library of Congress

Card 2/2 1. Ocean waves-Photographic analysis 2. Aerial photography-Applications 3. Aerial photography-Equipment

3(4) SOV/154-59-2-12/22

AUTHORS: Mazov, M. V., Aksenov, D. S., Cherkasov, I. A., Sharikov, Yu. D.

TITLE: Device for Taking Synchronized Stereo-photographs From Two Airplanes (Apparatura dlya sinkhronnoy stereofotos"yemki s dvukh samoletov)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Geodeziya i aerofotos"yemka, 1959, Nr 2, pp 77-86 (USSR)

ABSTRACT: In 1956, devices for taking synchronized aerial photographs were developed at the Laboratoriya aerometodov AN SSSR (Laboratory for Aerial Methods of the AS USSR). The fundamental condition is a high degree of synchronization. This synchronization can only be achieved with the help of a radio device, which the authors call a radio synchronizer. The essence of the functioning of the device lies in the fact that the impulses for the operation of the shutters of both aerial cameras are given at such an interval, that both shutters open at the same time, because even with aerial cameras of the same type the response time varies. The first model of a radio synchronizer was produced in 1956. A second model followed in 1957. Both designs are described here. Both had various deficiencies which were rectified

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with the third model. The device consists of a transmitting and a receiving set, installed in two airplanes. The principal wiring diagram is shown in figure 7 and the block wiring diagram in figure 6. The functioning of the radio synchronizer is described in detail. The dimensions of the transmitter are 250 × 300 × 150 mm and those of the receiver 300 × 500 × 250 mm. The weight of each device including the converter is 12 kg. A test proved that a reliable synchronization of 1/200 seconds is secured and that the receiving device is not subject to any interference at all. The device permits the control and adjustment of the synchronization whilst taking stereo-photographs. There are 10 figures.

ASSOCIATION: Laboratoriya aerometodov AN SSSR (Laboratory for Aerial Methods of the AS USSR)

S/050/60/000/009/007/008
B012/B063

AUTHORS: Cherkasov, I. A., Zdanovich, V. G.

TITLE: Application of Aeromethods in Oceanography

PERIODICAL: Meteorologiya i gidrologiya, 1960, No. 9, pp. 52 - 54

TEXT: This is a review of N. N. Lazarenko's article "On the Problem of the Application of Aeromethods in Oceanographic Investigations", which was published in Trudy Gosudarstvennogo okeanograficheskogo instituta (Transactions of the State Oceanographic Institute), 1959, No. 37. The author suggests to determine the position of the photographing airplane by direct intersection, by means of theodolites set up on the coast at points of known coordinates. N. N. Lazarenko's suggestion and the errors permitted by him are thoroughly described in this review. It is shown that the values given by N. N. Lazarenko, 60 km for average visibility of small objects and 80-100 km in the case of good visibility do not reflect the actual conditions in nature. It is noted that N. N. Lazarenko's suggestion of artificial illumination from the airplane during the night is impracticable due to the difficulties of

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Application of Aeromethods in Oceanography S/050/60/000/009/007/008
B012/B063

photographing at this time. Even if there is good visibility, airplanes can be observed over a distance of only 50 km. It is impossible to observe planes by means of theodolites. It is noted that the sections of the article dealing with the accuracy of determination and the carrying out of work contain several mistakes as, e.g., the suggestion of determining the flying height by measuring the vertical angles with theodolites. The author's calculations of the time of observation (27 seconds) are unfounded. Furthermore, he suggests an impracticable method of determining elements of external orientation. A few other inadequate suggestions and poor formulations are mentioned. Finally, it is said that the main difficulty of aerial photographing of the sea-level and the sea-bottom arises from motion. N. N. Lazarenko's principal suggestions are all erroneous and impracticable. There are 7 Soviet references.

Card 2/2

CHERKASOV, I.A.

Stereophotography of sea waves from two airplanes. Trudy Okean kom. 9:186-191 '60. (MIRA 14:1)
(Waves) (Aerial photogrammetry)

SHARIKOV, Yu.D.; CHERKASOV, I.A.

Use of aerial photographic surveying in studying surface currents of the sea. Meteor. i gidrol. no.3:46-48 Mr '61. (MIRA 14:2)
(Ocean currents) (Aerial photogrammetry)

ZDANOVICH, V.G., doktor tekhh. nauk, prof.; RAMM, N.S., kand. tekhn. nauk, st. nauchnyy sotr.; SHARIKOV, Yu.D., kand. tekhn. nauk, st. nauchnyy sotr.; YANUTSH, D.A., kand. tekhn. nauk, st. nauchnyy sotr.; CHERKASOV, I.A., kand. tekhn.nauk; ALEKSEYEV-SHEMYAKIN, V.P., nauchnyy sotr.; KOL'TSOV, V.V., nauchnyy sotr.; KOSHECHKIN, B.I., nauchnyy sotr.; SEMENCHENKO, I.V., nauchnyy sotr.; UGLEV, Yu.V., nauchnyy sotr.; KUZINA, A.M., starshiy laborant; KUDRITSKIY, D.M., kand. tekhn. nauk, dots., retsenzent; VEYNBERG, V.B., doktor tekhn. nauk, retsenzent; LOSHCHILOV, V.S., kand.geogr. nauk, retsenzent; REKHTZAMER, G.R., kand. tekhn.nauk, dots., retsenzent; KOZLYANINOV, M.V., kand. geogr. nauk, retsenzent; BUSHUYEV, A.V., inzh., retsenzent; ZAMARAYEVA, R.A., tekhn. red.

[Use of airborne methods to study the sea] Primenenie aerometodov dlia issledovaniia moria. Pod obshchei red. V.G.Zdanovicha. Moskva, Izd-vo Akad. nauk SSSR, 1963. 546 p. (MIRA 16:4)

1. Akademiya nauk SSSR. Laboratoriya aerometodov. 2. Laboratoriya aerometodov Akademii nauk SSSR (for Zdanovich, Ramm, Sharikov, Yanutsh, Cherkasov, Alekseyev-Shemyakin, Kol'tsov, Koshechkin, Semenchenko, Uglev, Kuzina).
(Aeronautics in oceanography) (Aerial photogrammetry)

CHERKASOV, I.D.

52-3-9/9

AUTHOR: Cherkasov, I. D.

TITLE: On Transforming the Diffusion Process to a Wiener Process. (O preobrazovanii diffuzionnogo protsessa v vinerovskiy.)

PERIODICAL: Teoriya Veroyatnostey i Yeye Primeneniya, 1957, Vol.II, Nr.3. pp. 384-388. (USSR)

ABSTRACT: The purpose of the present note is to investigate a continuous one-dimensional Markov process X(t) in the interval I. The necessary and sufficient conditions for the existence of transformation of type

$$\left.\begin{aligned} & t' = \varphi(t),\ x' = \psi(t,x),\ \tau' = \varphi(\tau),\ \xi' = \psi(\tau,\xi); \\ & f(t,x;\tau,\xi) = \frac{\partial\psi(\tau,\xi)}{\partial\xi} f'(t',x';\tau',\xi'), \end{aligned}\right\} \quad \text{(Eq.8)}$$

transforming

$$\frac{\partial f}{\partial t} + a(t,x)\frac{\partial^2 f}{\partial x^2} + b(t,x)\frac{\partial f}{\partial x} = 0 \qquad \text{(Eq.2)}$$

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On Transforming the Diffusion Process to a Wiener Process.

into

$$\frac{\partial f^2}{\partial t^1} + \frac{\partial^2 f^1}{\partial x^{1 2}} = 0 \qquad \text{(Eq.10)}$$

are given. It is known that conditional distribution density

$$f(t, x, \tau, \xi) = \frac{1}{2\sqrt{\pi(\tau - t)}} \exp\left[-\frac{(\xi - x)^2}{4(\tau - t)}\right]$$

is a solution to differential equation $f_t^1 + f_{xx}^{11} = 0$ and determines a continuous Markov process. In the general case a Markov process of the diffusion type is described by Kolmogorov's differential equation. The purpose of this paper is to transform a continuous process of the diffusion type into a process with the above-mentioned distribution. This transformation exists if $\Delta = 0$, where Δ is some determinant composed

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On Transforming the Diffusion Process to a Wiener Process.

of coefficients $a(t, x)$ and $b(t, x)$ of Kolmogorov's equation. Finally, examples of processes are given to which the theorem proved herein can be applied. There are 2 Slavic references.

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Card 3/3

CHERKASOV, I. D.

42-5-13/17

AUTHOR: CHERKASOV, I.D.

TITLE: On Equations of Kolmogorov (Ob uravneniyakh Kolmogorova)

PERIODICAL: Uspekhi Mat.Nauk, 1957, Vol.12, Nr.5, pp. 237-244 (USSR)

ABSTRACT: Given the system of parabolic equations

$$(1)\begin{cases} \dfrac{\partial f(s,x,\xi)}{s} = a(x)\dfrac{\partial^2 f(s,x,\xi)}{\partial x^2} + b(x)\dfrac{\partial f(s,x,\xi)}{\partial x} \\ \dfrac{\partial f(s,x,\xi)}{s} = \dfrac{\partial^2}{\partial \xi^2}\left[a(\xi)f(s,x,\xi)\right] - \dfrac{\partial}{\partial \xi}\left[b(x)f(s,x,\xi)\right], \end{cases}$$

where $a(x) > 0$ is a two times continuously differentiable function and $b(x)$ is a one times continuously differentiable function, $x \in (-\infty, \infty)$. The author seeks sufficient conditions which have to be satisfied by $a(x)$ and $b(x)$ in order that (1) for $s > 0$ has a unique solution $f(s,x,\xi)$ which satisfies the following conditions: 1. $f \geqslant 0$; 2. $\int\limits_{-\infty}^{\infty} f d\xi = 1$;

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3. $\int_{-\infty}^{\infty} f(s-t,x,y)f(t,y,\xi)dy = f(s,x,\xi)$; 4. $\lim_{s \to 0} \frac{1}{s} \int_{|\xi-x|>\delta} f\, d\xi = 0$;

5. $\lim_{s \to 0} \int_{|\xi-x|<\delta} f\, d\xi = 1$; 6. $\lim_{s \to 0} \frac{1}{s} \int_{|\xi-x|<\delta} (\xi-x) f\, d\xi = b(x)$;

7. $\lim_{s \to 0} \frac{1}{s} \int_{|\xi-x|<\delta} (\xi-x)^2 f\, d\xi = 2a(x)$. Here let $s > t > 0$, $\delta > 0$.

Theorem: Let the functions $a(x)$, $\frac{1}{a(x)}$, $b(x) - \frac{a'(x)}{2}$, $b'(x) - \frac{a''(x)}{2}$ be bounded for all x; for all x there exist continuous derivatives $a''(x)$, $b'(x)$. Then there exists a unique solution of (1) which satisfies the conditions 1.-7.

One Soviet and 2 foreign references are quoted.

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Card 2/2

1. Parabolic equations 2. Differential equations

CHERKASOV, I.D., Cand Phys-Math Sci--(diss) "On continuous Markov processes controlled by Kolmogorov equations." Kazan', 1958. 7 pp (Min of Higher Education USSR. Kazan' Order of Labor Red Banner State U im V.I.Ul'yanov-Lenin), 150 copies (KL,45-58, 142)

CHERKASOV, I.D.

Inversion of integro-differential operators by means of Green's function. Izv. vys. ucheb. zav.; mat. no.2:223-235 '60. (MIRA 13:7)

1. Kazanskiy pedagogicheskiy institut.
(Operators (Mathematics))

CHERKASOV, I.D. (Murmansk)

Sign of coordinate homogeneity for continuous Markov processes.
Teor. veroiat. i ee prim. 5 no.2:229-237 '60. (MIRA 13:9)
(Calculus of tensors)

S/124/62/000/005/027/048
D251/D308

AUTHOR: Cherkasov, I.D.

TITLE: Non-stationary transfer processes in the turbulent motion of a liquid

PERIODICAL: Referativnyy zhurnal. Mekhanika, no. 5, 1962, 105-106, abstract 5B681 (An. ştiinţ. Univ. Iaşi, 1960, Sec. 1, v. 6, no. 1, 89 - 96)

TEXT: The equation

$$\frac{\partial}{\partial z}\left[A(z, t)\frac{\partial R}{\partial z}\right] = U(z, t)\frac{\partial R}{\partial t} \qquad (1)$$

is considered, with the boundary conditions $R(0, t) = \varphi_1(t)$, $R(z, 0) = \varphi_2(z)$, which describes the transfer of an impurity in a turbulent current flowing round a cylindrical surface. Here $R(z, t)$ is the concentration of the impurity, z is the coordinate reckoned along the normal to the surface, and t - along the surface; $A(z, t) = \lambda + D(z, t)$, where λ is the coefficient of molecular transfer and

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$D(z, t)$ the coefficient of turbulent transfer; $U(z, t)$ is the velocity of the current, $0 \leqslant t < \infty$, $0 \leqslant z < \infty$, $D(0, t) = 0$. Conditions are obtained for which the equation (1) after the transformation of coordinates $\xi = \Psi(z, t)$, $\tau = \varphi(t)$. $V(\xi, \tau) = R(z, t)$ obtains the much simpler form

$$\frac{\partial^2 V}{\partial \xi^2} = B(\xi) \frac{\partial V}{\partial \tau}$$

which has already been studied, where the boundary conditions do not become complicated. The case $B(\xi) = \xi^m$ is considered separately. Particular examples are given. [Abstractor's note: Complete translation].

CHERKASOV, I.D.

Transformation of diffusion processes of a special form to a Wiener process. Bul Ac Pol mat 10 no.9:463-467 '62.

1. Presented by A. Mostovski [Mostowski].

S/044/62/000/012/027/049
A060/A000

AUTHOR: Cherkasov, I. D.

TITLE: Example of a diffusion process, homogeneous with respect to the abscissa and time

PERIODICAL: Referativnyy zhurnal, Matematika, no. 12, 1962, 7, abstract 12V27 (Časop. pěstov. mat., 1961, v. 86, no. 3, 367 - 371; summaries in Czech, French)

/B

TEXT: The conditions are found under which a homogeneous Markov process on a straight line with a diffusion coefficient Cx^2+Rx+S and transport coefficient $Ax+B$ may be transformed into a Wiener-type process by an interchange of the variables t and x.

A. V. Skorokhod

[Abstracter's note: Complete translation]

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38838
S/039/62/057/003/002/002
B112/B104

AUTHOR: Cherkasov, I. D. (Murmansk)

TITLE: Transformation of parabolic equations

PERIODICAL: Matematicheskiy sbornik, v. 57 (99), no. 3, 1962, 297 - 318

TEXT: It is demonstrated that the differential equation $\partial f(t,x)/\partial t + B^{ij}(t,x)\partial^2 f(t,x)/\partial x^i \partial x^j + A^i(t,x)\partial f(t,x)/\partial x^i = 0$ can be transformed into the differential equation $\partial\varphi'(\tau,u')/\partial\tau + B^{i'j'}(\tau,u')\partial^2\varphi'(\tau,u')/\partial u^{i'}\partial u^{j'} + A^{i'}(\tau,u')\partial\varphi'(\tau,u')/\partial u^{i'} = 0$ by way of the transformations $t' = \varphi(t)$, $x^{i'} = \psi^{i'}(t,x^1,\ldots,x^n)$, if and only if there is an integer $K \geqslant 0$ such that (a) the system of equations

$$\alpha^{\beta'} = 1 \ (\beta' = 0), \quad \alpha^{\beta} = 1 \ (\beta = 0), \quad \frac{\partial x^{\beta'}}{\partial x^{\beta}} = U_{\beta}^{\beta'}, \qquad (31)$$
$$\alpha^{\beta'} = \alpha^{\beta} U_{\beta}^{\beta'} U_{0'}^{0}, \quad B^{i'j'} = U_i^{i'} U_j^{j'} B^{ij} U_{0'}^{0},$$
$$\overline{R}_{\beta\gamma\delta}^{\alpha} U_{\alpha}^{\alpha'} = \overline{R}_{\beta'\gamma'\delta'}^{\alpha'} U_{\beta}^{\beta'} U_{\gamma}^{\gamma'} U_{\delta}^{\delta'},$$

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Transformation of parabolic equations S/039/62/057/003/002/002
B112/B104

$$\overline{R}^{\alpha}_{\beta\gamma\delta,\omega_1}U^{\alpha'}_{\alpha}=\overline{R}^{\alpha'}_{\beta'\gamma'\delta',\omega'_1}U^{\beta'}_{\beta}U^{\gamma'}_{\gamma}U^{\delta'}_{\delta}U^{\omega_1}_{\omega'_1},$$

$$\cdots\cdots\cdots\cdots\cdots\cdots\cdots$$

$$\overline{R}^{\alpha}_{\beta\gamma\delta,\omega_1,\ldots,\omega_K}U^{\alpha'}_{\alpha}=\overline{R}^{\alpha'}_{\beta'\gamma'\delta',\omega'_1,\ldots,\omega'_K}U^{\beta'}_{\beta}U^{\gamma'}_{\gamma}U^{\delta'}_{\delta}U^{\omega'_1}_{\omega_1}\ldots U^{\omega'_K}_{\omega_K}$$

is consistent with respect to x^{α} and $U^{\alpha'}_{\alpha}$, and that (b) all the solutions of this system satisfy the equations

$$\overline{R}^{\alpha}_{\beta\gamma\delta,\omega_1,\ldots,\omega_{K+1}}U^{\alpha'}_{\alpha}=\overline{R}^{\alpha'}_{\beta'\gamma'\delta',\omega'_1,\ldots,\omega'_{K+1}}U^{\beta'}_{\beta}U^{\gamma'}_{\gamma}U^{\delta'}_{\delta}U^{\omega'_1}_{\omega_1}\ldots U^{\omega'_{K+1}}_{\omega_{K+1}}. \quad (32)$$

The symbols $\overline{R}^{\alpha}_{\beta\gamma\delta}$, $\omega_1,\ldots,\omega_{K+1}$ denote covariant derivatives of the curvature tensor $\overline{R}^{\alpha}_{\beta\gamma\delta}$ of the Riemannian space as given by these transformation formulas. The one-dimensional case is considered separately. A complete system of scalar invariants is constructed for one-dimensional parabolic equations. The inversibility of one-dimensional Markov processes in the sense of A. N. Kolmogorov is shown.

SUBMITTED: October 5, 1960

Card 2/2

CHERKASOV, I.D. (Murmansk, SSSR)

On a method of determining transition probability in Brownian motion.
Rev math pures 7 no.3:369-382 '62.

CHERKASOV, I.D. (Kazan)

Computing the transition probabilities of the multidimensional Brownian motion in certain cases. Rev math pures 8 no.3:415-420 '63.

CHERKASOV, I. D. (Kazan')

Computing transitional probabilities of the multidimensional Brownian movement in some particular cases. Rev math pures 8 no. 3:415-420 '63

ACCESSION NR: AP4039631 S/0140/64/000/003/0170/0183

AUTHOR: Cherkasov, I. D. (Kazan')

TITLE: Homogeneity of a diffusion process of special form and its construction in the Gaussian case

SOURCE: IVUZ. Matematika, no. 3, 1964, 170-183

TOPIC TAGS: Mathieu equation, homogeneous process, diffusion process, passage time density, diffusion coefficient, nondiscrete process, Wiener function, Markov process

ABSTRACT: Let $f(t,x;\tau,\xi)$ denote the passage time density corresponding to the Markov process $X(t)$ of diffusion type with continuous time and a set E of possible states which is an interval subset of $(-\infty, \infty)$. Under rather wide assumptions the function $f(t,x;\tau,\xi)$ satisfies

$$\frac{\partial f}{\partial t} + a(t, x)\frac{\partial^2 f}{\partial x^2} + b(t, x)\frac{\partial f}{\partial x} = 0, \qquad (1)$$

where $a(t,x)$ is the diffusion coefficient, and $b(t,x)$ is the passage coefficient of the process $X(t)$. The author generalizes previous results to a process $X(t)$

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CHERKASOV, I. D.

Transactions of the Sixth Conference (Cont.) SOV/6371

32. Khas'minskiy, R. Z. Probability Representation of the Solutions of Some Differential Equations 177

33. Cherkasov, I. D. Transformation of Kolmogorov's Equations and Reversibility of Markov Processes 183

34. Shur, M. G. Harmonic and Superharmonic Functions Associated With Markov Processes 185

INFORMATION THEORY AND APPLICATIONS

35. Aleksandrov, M. S., F. F. Dobryakova, and V. F. Krapivin. Calculation of the Multidimensional Density of the Probability Distribution of Oscillation-Phase Differences in the Presence of a Fluctuating Signal, Noises, and the Correlated Noise 189

Transactions of the 6th Conf. on Probability Theory and Mathematical Statistics and of the Symposium on Distributions in Infinite-Dimensional Spaces held in Vil'nyus, 5-10 Sep '60. Vil'nyus Gospolitizdat Lit SSR, 1962. 493 p. 2500 copies printed

CHERKASOV, I.D. (g. Kazan').

Uniformity of a diffusion process of a special type and its construction in the Gaussian case. Izv. vys. ucheb. zav.; mat. no.3:170-183 '64. (MIRA 17:12)

CHERKASOV, I.D. (Kazan)

On the random processes of the Bachelier type. Rev math Roum 9 no.9: 849-857 '64.

CHERKASOV, I.D.

Conditions for the homogeneity of the diffusion process with polynomial coefficients of diffusion and transmission. Bul Ac Pol math 12 no.12:747-752 '64.

1. Submitted October 10, 1964.

L 01829-67EWP(e)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/DJ

ACC NR: AP6035622 SOURCE CODE: BU/0011/65/018/011/0991/0994

34

B

CHERKASOV, I. D., Nizhniy Tagil - USSR

"Transformation of the Heat Transfer Equation Through Porous Media for the Case of an Infinite Oil Stratum"

Sofia, Doklady Bolgarskoy Akademii Nauk, Vol 18, No 11, 1965, pp 991-994

Abstract: [Russian article] The author studies the process of heat exchange between a porous medium and the heat carrier. The pertinent equations are specialized for the case of an infinite oil stratum, and the conditions needed for the solvability of these equations are formulated in the form of two theorems. The calculations are carried out for the case of heat exchange during an irrotational flow with the thermal conductivity as function of time only. This paper was presented by Academician Khr. Khristov on 22 July 1965. Orig. art. has: 16 formulas. [JPRS: 36,645]

TOPIC TAGS: thermal conductivity, conductive heat transfer

SUB CODE: 20 / SUBM DATE: 22 Jul 65 / SOV REF: 004

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L 4348-66 EWT(d) IJP(c)

ACC NR: AP5028768 SOURCE CODE: BU/0011/65/018/002/0093/0096

19

B

AUTHOR: Cherkasov, I. D. (Nizhniy Tagil) 44,55

ORG: none

TITLE: Change of variable in an one-dimensional parabolic equation 16,44,55

SOURCE: Bulgarska akademiya na naukite, v. 18, no. 2, 1965, 93-96

TOPIC TAGS: variational calculus, parabolic differential equation, function theory

ABSTRACT: [Russian article] Let D denote the region $[(\alpha_1(t) \leq x \leq \alpha_2(t)) \cap (t \geq t_1)$ where $\alpha_i(t)$ is a continuously differentiable function for $t \geq t_1$ and t_1 is a constant number. Let, in addition, functions $a^i(i = -1, 0, 1, 2)$ be defined and sufficiently smooth in D, $a^2 > 0$, and $\varphi(x)$ and ψ_i $(i = 1, 2)$ continuous. The problem consists in finding a function f continuously differentiable in D once over t and twice over x, and satisfying within D the differential equation

$$a^i f_i - \partial f / \partial t = 0, \tag{1}$$

while on the boundary of D it satisfies the supplementary conditions

$$f(t_1, x) = \varphi(x), \quad f(t, \alpha_i(t)) = \psi_i(t) \; (i = 1, 2). \tag{2}$$

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ACC NR: AP5028768

In (1) i is summed from -1 to 2 and

$$f_l \equiv \partial^l f / \partial x^l (l = 0, 1, 2),\ f_{-1} = 1. \qquad (2a)$$

Similarly formulated problems are often solved by a change in arguments and in the desired function (see, e.g., M. A. Pudovkin, Tr. po teorii fil'tratsii i gidrodinamike neftyanogo plasta /Articles on the Theory of Filtration and Hydrodynamics of Oil Beds/, Kazan gosuniversitet, 1961, pp 35-42). The present paper derives the necessary and sufficient conditions for the problem (1) + (2) to be solvable by one of the change-of-variables methods. It discusses special cases and solves two illustrative examples. The method differs from the previously known (see, e.g., R. L. Ingraham, Amer. J. Math., 75, 1953, No 4, 691-698) in that the transformation is equally applied to the arguments of the desired function. The work was presented by Kh. Khristov, Academician 13 Nov 64. Orig. art. has: 15 formulas. [JPRS]

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1. CHERKA[redacted]SOV, I. I.

2. USSR (600)

4. Plasticity

7. Connection between Poisson's ratio and the plastic properties of a material.
Zhur. tekh. fiz. 22 No. 11, 1952

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Effect of the method of setting up a tamper on the results of testing soil load capacity. Dokl. AN SSSR, 82, No. 3, 1952.

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[Mechanical properties of road-beds] Mekhanicheskie svoistva gruntovykh osnovanii. Moskva, Nauchno-tekhn. izd-vo avtotransp. lit-ry, 1958. 155 p. (MIRA 11:12)

(Soil mechanics)
(Roads)

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(Soil mechanics)

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(MIRA 13:7)

(Foundations) (Plagemann, V.)
(Langner, V.)

CHERKASOV, I.I., prof.

Modern methods for designing improved airfield pavements in the United States. Avt. dor. 23 no.5:27-28 My '60. (MIRA 13:10)
(United States--Airports--Planning)

CHERKASOV, I.I., prof.

Anti-heaving measures used in maintaining roads in Europe. Avt. dor. 22 [i.e.23] no.9:26-27 S '60. (MIRA 13:9)
(Europe--Roads--Maintenance and repair)

CHERKASOV, I.I., prof.; PARFENOV, A.P.

Stabilizing saturated soils by carbamide resins. Avt.dor. 24 no.2:18 F '61. (MIRA 14:3)

(Soil stabilization)

CHERKASOV, I.I.

"From theory to practice in soil mechanics" by Karl Terzaghi. Reviewed by I.I.Cherkasov. Osn., fund.i mekh.grun. 3 no.6:29 '61. (MIRA 15:4)

(Soil mechanics) (Terzaghi, Karl)

MARKOV, Lev Alekseyevich, kand. tekhn. nauk; PARFENOV, Anatoliy Pavlovich, inzh.; PUGACHEV, Boris Vasil'yevich, kand. tekhn. nauk; CHERKASOV, Igor' Ivanovich, doktor tekhn. nauk, prof.; YEGOZOV, V.P., red.; BODANOVA, A.P., tekhn. red.

[Improving soil properties by the use of surface active agents and aggregating materials] Uluchshenie svoistv gruntov poverkhnostnoaktivnymi i strukturoobrazuiushchimi veshchestvami. Pod red. I.I.Cherkasova. Moskva, Avtotransizdat, 1963. 175 p. (MIRA 16:6)
(Soil stabilization) (Road construction)

CHERKASOV, I.I., prof.

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24-25 Jl '64. (MIRA 17:12)

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M-lecular structure and properties of chemical compounds used for soil stabilization. Avt.dor. 27 no.11:22-24 N '64.

(MIRA 18:4)

Cherkasov I. M.

AUTHOR: Cherkasov, I.M., Candidate in Economics 3-6-3/29

TITLE: Instruction in Political Economy and the Curriculum of the VUZ (Prepodavaniye politicheskoy ekonomii i profil' VUZa)

PERIODICAL: Vestnik Vysshey Shkoly, 1957, # 6, p 14-16 (USSR)

ABSTRACT: This year, the Moscow Institute of Non-Ferrous Metals and Gold (Moskovskiy institut tsvetnykh metallov i zolòta) conducts its instructional work in closer contact with industry. Institute instructors are reading lectures on political economy to workers of non-ferrous metallurgy, and the latter deliver lectures at the Institute on industrial subjects. In this connection the instructors A.N. Drozdova, V.F. Gavrilin and S.E. Korkin are mentioned as examples of this type of mutual cooperation.

The author mentions the Zolotushinsk Ore Mine Administration which in 1955 showed a profit of 30 %, and on 1 October 1956, 40.6 %. From 1950 to 1955 the production of ore increased 2.7 times, and the work norm increased 70 %. According to the plan for 1956, depreciation for enterprises in non-ferrous metallurgy was fixed at 5.48 %. During the 6th Five-Year Plan non-ferrous metallurgy should, by means of a better organization of product-

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Instruction in Political Economy and the **Curriculum of the VUZ**

47 %, lead - 34 %, aluminum - 20 %, and nickel - 60 %. The introduction of the method of concentrate calcination in the so-called "boiling layer" will be of great importance in carrying out this task. The work of a smelting furnace can be considerably intensified by applying air enriched with oxygen and by preheating the air delivered to the furnace. The article points out that during the first year of the 6th Five-Year Plan the non-ferrous metallurgical industry lowered the production costs by 5.5 % as compared with 1955.

ASSOCIATION: The Moscow Institute of Non-Ferrous Metals and Gold imeni M.I. Kalinin (Moskovskiy institut tsvetnykh metallov i zolota imeni M.I. Kalinina)

AVAILABLE: Library of Congress

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CHERKASOV, I. S.

Cherkasov, I. S.

"Eye injuries in children." Odessa State Medical Inst imeni N. I. Pirogov. Odessa, 1956. (Dissertation for the Degree of Candidate in Medical Science)

So: Knizhnaya letopis', No. 25, 1956

CHERKASOV, I.S., mladshiy nauchnyy sotrudnik

Prophylaxis of eye injuries in children. Uch. zap. UEIGB 4:338-343 '58.
(MIRA 12:6)

1. Ukrainskiy eksperimental'nyy institut glaznykh bolezney i tkanevoy terapii imeni akademika V.P. Filatova.
(EYE--PROTECTION)

CHERKASOV, I.S., kand.med.nauk

Method for studying refraction in young children. Oft. zhur. 16 no.5:304-307 '61. (MIRA 14:10)

1. Iz Ukrainskogo nauchno-issledovatel'skogo eksperimental'nogo instituta glaznykh bolezney i tkanevoy terapii imeni akademika V.P.Filatova (direktor - prof. N.A.Puchkovskaya).

(EYE--ACCOMODATION AND REFRACTION)

CHERKASOV, I.S., kand.med.nauk

Effectiveness of goniotomy and goniopuncture in hydrophthalmia. Oft. zhur. 17 no.1:39-45 '62. (MIRA 15:3)

1. Iz Ukrainskogo nauchno-issledovatel'skogo eksperimental'nogo instituta glaznykh bolenzye i tkanevoy terapii imeni akademika V.P. Filatova (dir. - prof. N.A. Puchkovskaya).

(EYE--SURGERY)
(GLAUCOMA)

PIVEN', Viktor Danilovich, doktor tekhn. nauk, prof.; BOGDANOV, Valentin Kirillovich; GANZHERLI, Emmanuil Il'ich; ZAMANSKIY, Abram Markovich; TROSHCHENKOV, I.I., retsenzent; CHERKASOV, K.I., red.

[Automation of power generating systems] Avtomatizatsiia energeticheskikh blokov. Pod obshchei red. V.D.Piven'. Moskva, Energiia, 1965. 351 p. (MIRA 19:1)

KABAN, A.N.; CHERKASOV, L.A.

Automatic control unit with programming by the "pendulum" cycle. Avt. i prib. no.4:18-21 O-D '64 (MIRA 18:2)

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ACC NR: AP6011509 SOURCE CODE: UR/0382/66/000/001/0003/0034

AUTHOR: Polovin, R. V.; Cherkasova, K. P.

ORG: none

54

B

TITLE: Magnetosonic waves

SOURCE: Magnitnaya gidrodinamika, no. 1, 1966, 3-34

TOPIC TAGS: sound wave, perturbation, perturbation zone, sound propagation, wave equation, magnetosonic wave

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ABSTRACT: The propagation of magnetosonic waves in a uniform medium has been investigated. The wave-front of the system of hydromagnetic equations was analyzed. It was proved the Huygens' principle is valid only for one-dimensional waves. There are two lacoons (zero perturbation regions) inside the region of perturbation in the two-dimensional case. The lacoons are absent in the three-dimensional case. The distinction between fast and slow magnetosonic waves is valid only in a one-dimensional case. In two-dimensional and three-dimensional cases, all perturbations propagate at the fast magneto-sonic-wave velocity. The only case when Altven's speed equals the speed of sound was analyzed. Orig. art. has: 6 figures and 7 formulas. [Based on author's abstract] [NT]

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OTH REF: 011/

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